

REMARKS

Claims 1-17 are pending in the present application. The applicants have carefully considered the Office Action mailed on June 4, 2004 and respond as follows:

Claim Rejections - 35 USC § 103

Claims 1-6, 9, 11, and 11-17 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,046,841 to Juds et al. (“the Juds patent” or “the ‘841 patent”), which discloses a token having at least one predetermined optical characteristic. The term “optical characteristic” refers to the tendency to reflect, refract or defract [diffract] light with respect to a known angle or angles. Col. 2, lines 44 to 48. The predetermined optical characteristics can be produced by forming light bending impressions in the token surface or subsurface. These light bending impressions can be diffraction gratings. Col. 2, lines 59 to 66. Juds is directed to predetermined optical characteristics that allow the token to be validated independent of orientation of the token. To achieve this objective, the Juds patent teaches different “facets” on the surface of the token, each of which provides a different predetermined optical characteristic. Col. 4, lines 34-35. Different facets are then arranged in repeating groups so that the predetermined optical characteristics are substantially orientation independent with respect to the token’s axis. Col. 4, lines 40-52.

Claim 1 of the present application is directed to “[a] coin having a metal surface structured with macroscopic reliefs for the representation of motifs which serve to specify the coin value and as a recognition feature, and fields of the surface, which are arranged on a circular

ring around the center point of the coin and which have microscopically fine relief structures with a diffraction action and which form an optically machine-readable identification, wherein the relief structures in the fields are gratings which are of the same spatial frequency (f), and that the relief structures differed by their azimuth (Ω) relative to the radical direction and/or by a symmetrical or asymmetrical relief profile." (Underlining added.)

The '841 Juds patent does not disclose that the diffraction gratings on the token should be configured in the manner described by the underlined passages of claim 1 of the present application. Specifically, the Juds patent neither teaches nor suggests the use of gratings which are: a) of the same spatial frequency (f) and in addition differ by their azimuth (Ω) relative to the radical direction; b) of the same spatial frequency (f) and in addition differ by a symmetrical relief profile; or c) of the same spatial frequency (f) and in addition differ by a symmetrical or asymmetrical relief profile, could be of any advantage with respect to other diffraction gratings.

In contrast to the specific limitations that describe and define the gratings in the claims of the present application, the Juds patent does not provide any description of the gratings that form the predetermined optical characteristic. The Juds patent teaches that the "light bending impressions can be, for example, prismatic facets, reflective facets, or diffraction gratings." Col. 2, lines 62-63. However, the Juds patent teaches very little about the structures of the gratings and the word "grating(s)" appears only 3 times in the specification. There is no teaching or suggestion in the Juds patent that the structure of the gratings are in any way similar to the grating structures in the claims of the present application.

In the three places in the specification where the word “gratings” is used, there is no specific teaching of the grating structure.

The predetermined optical characteristics can be produced, in one embodiment, by forming light bending impressions in the token surface or subsurface. These light bending impressions can be, for example, prismatic facets, reflective facets, or diffraction **gratings**. (Light bending through use of diffraction **gratings** can be differentiated from reflective or refractive light bending by use of a wavelength sensitivity test.)

Col. 2, lines 59-66.

The tokens may be formed by any appropriate high volume, low cost manufacturing technique, such as plastic injection molding, plastic hot stamping, minting, metal stamping, or photographically reproduced **gratings**, dependent in part on the method of light bending used.

Col. 3, lines 29-34.

These three places where the word “gratings” appears in the Juds patent neither teach nor suggest the structure of the gratings claimed in the present application. Specifically, the Juds patent does not disclose whether the gratings have the same or different spatial frequencies, nor does the Juds patent disclose whether or not the gratings differ by their azimuth relative to the radial direction and/or by a symmetrical or asymmetrical relief profile.

The Juds patent fails to teach the structure of the gratings because it is primarily directed to optical characteristics formed using facets, not gratings. The word facet(s) is used more than 30 times in the Juds specification while the word “grating(s)” is only mentioned 3 times (as discussed above) and no details of the grating structure are provided.

The present invention uses an asymmetrical relief profile which advantageously allows the authenticity of the coin to be judged on the basis of the different levels of intensity of the partial beams that are diffracted into the plus first diffraction order and into the minus first diffraction order. Specification, p. 4, line 25 to p. 5, line 5. The Juds patent neither teaches nor suggests diffraction structures that produce different levels of intensity of partial beams.

Claim 2 is directed to “[a] coin having a metal surface structured with macroscopic reliefs for the representation of motifs which serve to specify the coin value and as a recognition feature, and fields of the surface, of which at least one has a microscopically fine relief structure with a diffraction action, and which form an optically machine-readable identification, wherein the relief structures of the identification are selected from M groups of gratings, wherein the relief structures of the identification are selected from M groups of gratings, that the grating vectors of all gratings of the M groups are radially oriented, that in each of the M groups the spatial frequency (f) of the relief structure is selected in dependence on the radial spacing (R) of the field from the center point of the coin such that upon illumination of the relief structure by means of a light source in point form arranged perpendicularly above the center point, with the wavelength (λ), one of the two partial beams of the diffracted light crosses the center point at a spacing (h_D) which is predetermined for said group.” (Underlining added.)

The Juds ' 841 patent does not teach nor suggest that the diffraction gratings on the token should be configured with the limitations disclosed in the underlined passages of claim 2. As discussed above, the Juds patent is directed to the use of facets and is almost devoid of teachings

relating to gratings. The Juds patent does not teach the use of groups of gratings wherein all of the gratings have radially oriented grating vectors. The Juds patent also does not teach the selection of the spatial frequency (f) of the relief structure in each of the groups of gratings in dependence on the radial spacing (R) of the field from the center point of the coin such that upon illumination of the relief structure by means of a light source in point form arranged perpendicularly above the center point, with the wavelength (λ), one of the two partial beams of the diffracted light crosses the center point at a spacing (h_D) which is predetermined for that group. Moreover, the Juds patent neither discloses or suggests the advantages of diffraction gratings with such a structure.

The Juds patent discloses the use of diffraction gratings in a very broad and vague manner. One of ordinary skill in the art would not be able to make the diffraction gratings disclosed in claims 1 and 2 of the present application based on the teachings of the Juds patent. Moreover, the Juds patent provides no teaching or suggestion of diffraction gratings having the structures disclosed in claims 1 and 2. The structures of the gratings in claims 1 and 2 of the present application provide coins with unique features with respect to manufacturing costs, forgery-proofness, quantity of information to be stored or encoded, and simplicity or costs of checking its authenticity. Specification, page 2, lines 13 to 18, page 5, lines 6 to 19 and page 6, lines 6 to 11. Such unique features and the diffraction gratings used to provide such features are not found in the Juds patent. Therefore, the applicants respectfully submit that the Juds '841 patent neither teaches nor suggests the grating structures in independent claims 1 and 2. In

addition, dependent claims 3-17 which depend on either claim 1 or claim 2 are also not rendered obvious by the Juds patent for the same reasons stated with respect to claims 1 and 2.

Allowable Subject Matter

The Examiner has indicated that claims 7, 8 and 10 are objected to as being based on a rejected claim, but would be allowed if rewritten in independent form. The Applicants have not amended these claims to rewrite them in independent form because they believe that the arguments listed above sufficiently distinguish the Juds '841 patent and that these claims should now be in proper form and allowable.

The Applicants believe that the arguments submitted herein distinguish the Juds '841 patent from the present invention and respectfully request that the rejection of the claims be withdrawn. If the Examiner has any questions or comments relating to this Reply, he is respectfully invited to contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,



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